

A Report on the Applications for a Spacecraft Avionics Functional Model

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In an earlier paper, the author described a Spacecraft Avionics Functional Model, and then included a description of five applications of this model. This is a follow-on paper, describing the results of the work that has been performed in the last year on the definition and development of these applications.

The proposed model is a framework for the description of the functions that are generically part of the implementation of a spacecraft. Therefore, this model provides the ability to describe the functions that are performed by the avionics onboard a spacecraft, both in the case of a typical spacecraft, and for nearly any specific spacecraft implementation. Five specific applications of this model were described, and these are:

- Education & Training
- Systems Engineering
- Modeling Applications
- Analysis/Trade/Cost Applications
- Functional Standardization & Commonality

This paper provides a description of the activities that have taken place in the last year in the development of these applications. There has been progress toward the development all five of these applications. A WEB site is now operational that describes some of the details of the Spacecraft Avionics Functional Model (Education). A detailed description of one of the avionics functions has been completed, and an outline and specific generic requirements for a Commanding Functional Requirements document has been generated (systems engineering). An initial tool has been created in order to perform an analysis of the Commanding Function requirements (systems engineering). This tool also allows for conversion of these requirements into a direct estimate into the primary avionics resources that are consumed by an avionics function: memory, processor cycles, and input/output bandwidth (modeling). Initial analysis of different spacecraft architectures has also been completed, and is described by this paper (analysis/trade applications). However, further work in the area of functional standardization of the spacecraft avionics requirements is described in a separate paper.